

NEMATOLOGY.—*Paratylenchus projectus*, new species (*Nematoda*, *Criconematidae*), with a key to the species of *Paratylenchus*.¹ W. R. JENKINS, University of Maryland. (Communicated by R. Bamford.)

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In July 1955, root and soil samples were collected from a pasture in Prince Georges County, Md., in an effort to determine the cause of stunted growth and general decline of grasses in this field. Examination revealed that a new species of *Paratylenchus* was present in large numbers.

To determine parasitism, specimens of this species were transferred to pots containing plants of tall fescue, *Festuca elatior* var. Kentucky 31, which were maintained under greenhouse conditions. Since the field under examination was used from time to time for growing tobacco, seedlings of *Nicotiana tabacum* L. were also inoculated with specimens of *Paratylenchus* n. sp. Both tall fescue and tobacco supported large population increases under these conditions.

It is probable that decline and failure of this pasture is due, at least in part, to *Paratylenchus* n. sp. Therefore, investigations are being conducted to determine pathogenic effects of this nematode on grasses and tobacco.

Paratylenchus projectus, n. sp.

Fig. 1

25 females: 373.0 μ (289–475 μ); a = 18.7 (15.6–20.8); b = 4.0 (3.5–4.9); c = 15.4 (11.3–19.5); V = 84.3 per cent (82.6–86.9 per cent); stylet = 31.8 μ (24.8–37.1 μ).

Males: Unknown.

Female.—The cuticle is marked by rather fine transverse striae about one micron apart. The lateral field occupies about two-fifths of the body diameter and is marked by four evenly-spaced incisures. The slightly-offset lip region is truncate with a median labial extension and is marked by three transverse striations. Neither amphids nor cervical papillae have been observed; however, phasmids are located in the lateral field anterior to the anus. The conspicuous excretory pore varies in its location from just behind the median

swelling of the esophagus to the anterior end of the basal swelling of the esophagus, always on the ventral surface. There is an average of 50 post-vulval annulations.

The buccal cavity is small and there is no sclerotized cephalic framework. The spear averages 31.8 microns and has prominent knobs which are somewhat flattened on the anterior surface. The dorsal esophageal gland opens into the lumen of the esophagus about one-fifth the spear-length behind the base of the spear. There is a typically ericonematoid median bulb with a valvular apparatus behind which the duct of the ventral esophageal glands opens into the lumen of the esophagus. Posterior to the median bulb, there is a long and narrow isthmus about which lies the circumesophageal nerve ring. The terminal swelling of the esophagus is somewhat pyriform in shape. There is no cardia. The intestine, the cells of which are filled with many small, refractive inclusions, ends in a short rectum and obscure anus.

There is a single outstretched ovary which usually reaches to the anterior end of the intestine but has been observed as far anterior as the median esophageal bulb. The cap cell gives rise to several oogonia which are arranged in a double line. Only one egg, averaging 57.9 μ by 13.2 μ , was observed in the uterus at a time. The vulva is an anteriorly sloping, transverse slit flanked by lateral vulval membranes. No spermatheca or post-vulval uterine sac has been observed. There is a marked reduction in body diameter immediately behind the vulva.

Larvae were observed to have a small and indistinct esophagus. The median swelling was much reduced in size but did possess a large valvular apparatus.

The normal relaxed position was a ventral curving in both larvae and females.

Type host.—Soil about roots of pasture grass.

Type locality.—Upper Marlboro, Prince Georges County, Md.

Diagnosis.—The absence of males distinguishes *P. projectus* from *P. goodeyi* Oostenbrink, 1953, *P. hamatus* Thorne and Allen, 1950, *P. besoekianus* Bally and Reydon, 1931, *P. elachistus*

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Steiner, 1942, *P. minutus* Linford, 1949, *P. macrophallus* (de Man, 1880) Goodey, 1934, and *P. dianthus* Jenkins and Taylor, 1956.

This species differs in many ways from females of species in which no males have been reported.

From *P. bukowinensis* Micoletzky, 1922, *P.*

projectus can be distinguished by its slightly off-set lip region which is truncated and bears three striations, in its lack of a post-vulval uterine sac, lateral vulval wings, and in the shape of the spear knobs.

P. projectus differs from both *P. nanus* Cobb,

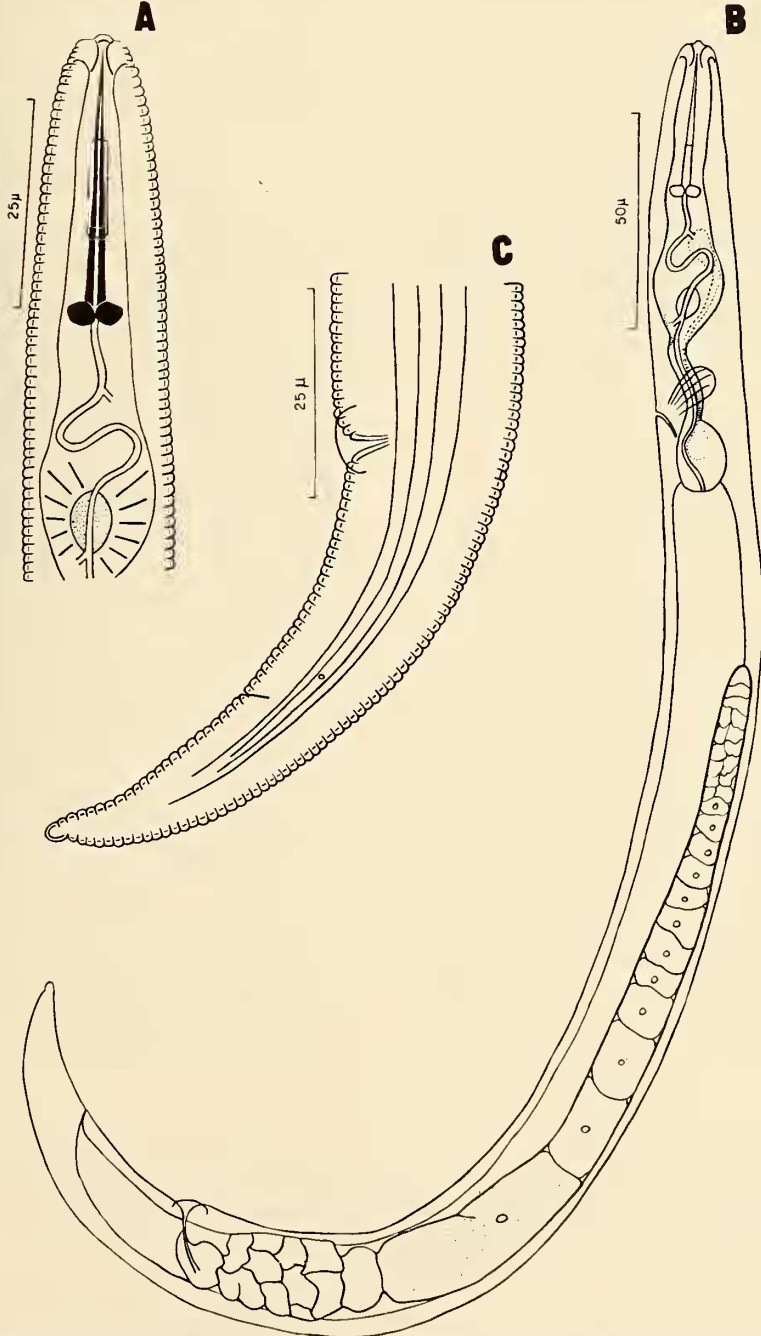


FIG. 1.—*Paratylenchus projectus*, n. sp.: A, Anterior portion; B, mature female; C, posterior portion.

1923 and *P. anceps* Cobb, 1923 in its offset, striated lip-region, its smaller spear which bears flattened knobs, and in its lack of a spermatheca. It differs further from *P. anceps* by having four incisures in the lateral field, while the latter has only two incisures.

P. curvata van der Linde, 1938, is smaller than *P. projectus* (330 μ as opposed to 373 μ), has a much smaller spear (24 μ as opposed to 31.8 μ), and does not bear a median labial extension.

Because of the frequent occurrence of *Paratylenchus* species in soil about roots of plants, a key is presented to aid in the identification of described species. This key was devised from published descriptions and illustrations, not from personal examination of specimens of each species. It is based for the most part on female characteristics, because males are frequently unknown or exist in very small numbers.

KEY TO SPECIES OF PARATYLENCHUS
MICOLETZKY, 1922

1. Lip region a truncated cone.....2
Lip region smooth and rounded.....8
2. Lateral field marked by two incisures
anceps Cobb, 1923
Lateral field marked by four incisures.....3
3. Postvulval uterine sac present.....4
Postvulval uterine sac absent.....5
4. Female spear about 19 μ long; male spear faded and indistinct
besoekianus Bally and Reydon, 1931
Female spear about 25 μ long; males absent
bukowinensis Micoletzky, 1922
5. Lateral vulval membranes present.....6
Lateral vulval membranes absent.....7
6. Female lip region striated; males absent
projectus, n. sp.
Female lip region not striated; males present
dianthus Jenkins and Taylor, 1956
7. Postvulval reduction in body diameter; males absent.....
curvata van der Linde, 1938
No postvulval reduction in body diameter; males frequent
macrophallus (deMan, 1880) Goodey, 1934

8. Females stout, spear 48-56 μ
goodeyi Oostenbrink, 1953
Females typically slender.....9
9. No marked postvulval reduction in body diameter....*hamatus* Thorne and Allen, 1950
Marked postvulval reduction in body diameter 10
10. Females 360-410 μ long; males absent
nanus Cobb, 1923
Females 234-310 μ long; males frequent.....11
11. Male with anal sheath surrounding spicula, tail convex-conoid....*minutus* Linford, 1949
Male without anal sheath, tail short and subacute.....*elachistus* Steiner, 1942

LITERATURE CITED

- BALLY, W., and REYDON, G. A. *De tegenwoordige stand van het vraagstuk van de wortelaaltjes in de koffiecultuur*. Arch. Koffiecult. Nederl. Indie 5: 92-94. 1931.
- COBB, N. A. *Notes on Paratylenchus, a genus of nemas*. Journ. Washington Acad. Sci. 13: 254-257. 1923. Also: Contr. Sci. Nematology 14: 367-370.
- GOODEY, T. *Observations of Paratylenchus macrophallus (de Man, 1800)*. Journ. Helm. 12: 79-88. 1934.
- JENKINS, W. R., and TAYLOR, D. P. *Paratylenchus dianthus, new species (Nematoda, Criconematidae), a parasite of carnation*. Proc. Helm. Soc. Washington 23: 124-127. 1956.
- LINDE, W. J. VAN DER. *A contribution to the study of nematodes*. Ent. Mem. Union South Africa 2: 25, 26, 34. 1938.
- LINFORD, M. B., OLIVERIRA, J. M. and MAMORU, I. *Paratylenchus minutus, n. sp., a nematode parasitic on roots*. Pacific Sci. 3: 111-119. 1949.
- MICOLETZKY, H. *Die freilebenden Erd-Nematoden*. Arch. Naturg., Abt. A, 87: 605-607. 1922.
- OOSTENBRINK, I. M. *A note on Paratylenchus in the Netherlands with the description of P. goodeyi n. sp. (Nematoda, Criconematidae)*. Tijdsch. Plantenziekten 59: 207-216. 1953.
- STEINER, G. *Plant nematodes the grower should know*. Proc. Soil Sci. Soc. Florida 4B 37-39. 1942.
- THORNE, G., and ALLEN, M. W. *Paratylenchus hamatus n. sp. and Xiphinema index n. sp., two nematodes associated with fig roots, with a note on Paratylenchus anceps Cobb*. Proc. Helm. Soc. Washington 17: 27-35. 1950.

The generality of men are so accustomed to judge of things by their senses that because air is invisible they ascribe but little to it, and think of it as but one remove from nothing.—R. BOYLE (1673)